REMARKS

The Official Action dated April 5, 2006 has been received and its contents carefully noted. In view thereof, claims 11 and 15 have been amended and new claims 17 and 18 have been added in order to better define that which Applicants regard as the invention. Accordingly, claims 11-18 are presently pending in the instant application.

Initially, Applicants wish to note that the Official Action dated April 5, 2006 includes the Examiner's Notice of References Cited on PTO Form-892. However, consideration and acknowledgement of Applicants' Information Disclosure Statements filed June 6, 2005, September 23, 2005 and January 11, 2006 have not yet been received. Accordingly, it is respectfully requested that the Examiner forward onto Applicants initialed copies of each of the noted PTO 1449 Forms indicating the Examiner's acknowledgement and consideration of the cited references. Copies of the PTO 1449 Forms are enclosed for the Examiner's convenience.

With reference now to the Official Action and particularly page 2 thereof, claims 11-14 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,151,770 issued to Inoue. This rejection is respectfully traversed in that the patent to Inoue neither discloses nor suggests that which is presently set forth by Applicants' claimed invention.

As can be seen from the foregoing amendments, independent claim 11 has been amended to recite an RF device comprising a plurality of semiconductor elements formed on a semiconductor substrate, a plurality of through holes which are provided between two adjacent ones of the plurality of semiconductor elements and pass from a surface through the backside of the semiconductor substrate wherein a distance between two adjacent holes of the plurality of through holes is smaller than a thickness of the semiconductor substrate so as to

reduce power leaking between two adjacent ones of the plurality of semiconductor elements. That is, a particular feature of the RF device recited in independent claim 11 resides in the fact that the distance between the two adjacent through holes is smaller than the thickness of the semiconductor substrate so as to reduce power leakage between two adjacent semiconductor elements. In accordance with Applicants' claimed invention and as set forth on page 8, lines 13-18 of Applicants' specification as well as Fig. 2, such a feature improves the isolation between the two adjacent semiconductor elements having through holes therebetween with respect to the radio frequency signal. Clearly, the patent to Inoue neither discloses nor remotely suggests that which is presently set forth by Applicants' claimed invention.

In reviewing the teachings of Inoue, it is noted that this reference merely discloses that a structure in which the via holes are formed so as to be disposed between the two semiconductor elements and the semiconductor substrate, and that such via holes are filled with a metal and are grounded for high frequencies. However, Inoue fails to disclose or remotely suggest a relationship between the distance of the two adjacent through holes and a thickness of the semiconductor substrate as specifically recited by Applicants' claimed invention.

It is further noted that Inoue merely discloses that the insulating film comprising SiON is formed on the semiconductor substrate and that the via holes are provided in the insulating film in the orthogonal direction to the substrate thereby separating the two semiconductor elements at high frequency. Inoue further discloses that when the insulating film in which the via holes are formed is thick, the insulating film having a multilayered structure is formed and the via holes are formed in each insulating film. In other words, Inoue considers the via holes in the insulating films more important than those in the

semiconductor substrate in order to separate the two semiconductor elements at high frequency by the via holes. However, as discussed in detail in Applicants' previous remarks filed September 23, 2005, even when the insulating film is formed on the semiconductor substrate, high frequency, which transmits between the two semiconductor elements, transmits within the semiconductor substrate. Therefore, even when the insulating film is formed on the semiconductor substrate, it is important to provide the via holes in the semiconductor substrate itself and to control the distance of the via holes.

It is further noted from the Official Action that the Examiner acknowledges that Inoue does not expressly disclose or distance between two adjacent ones of the plurality of through holes being smaller than a thickness of the semiconductor substrate. However, the Examiner goes on to state that it would have been obvious to one of ordinary skill in the art at the time of the invention to make the thickness of the substrate greater than 100 microns to have a solid support for the semiconductor substrate and in doing so cites *In re Rose,* 105 USPQ 237 (CCPA 1955) stating that *In re Rose* supports the proposition that a change in size is generally recognized as being within the level of ordinary skill in the art. However, in this regard, because Inoue focuses on the via holes of the insulating films rather than those in the substrate, Inoue cannot obtain the same effect as that of the present invention, that being changing the thickness of the semiconductor substrate and the distance between two adjacent through holes can rapidly and exponentially improve the isolation between the two adjacent semiconductor elements having through holes therebetween with respect to the radio frequency signal as discussed in Applicants' specification and show in Fig. 2. Accordingly, it is respectfully submitted that the particular structure set forth in accordance with Applicants' claimed invention, that being a structure wherein a distance between two adjacent ones of the plurality of through holes is smaller than a thickness of a semiconductor substrate so as to

reduce power leaking between two adjacent ones of the plurality of semiconductor elements is not merely a change in size as proposed by the Examiner but a significant distinction between Applicants' claimed invention and that set forth in Inoue. One not rendered obvious by case-law. Accordingly, it is respectfully submitted that Applicants' claimed invention as set forth in independent claim 11 as well as those claims which depend therefrom clearly distinguishes over the teachings of Inoue and is in proper condition for allowance.

With reference now to page 3 of the Office Action, claims 15 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Inoue as applied to claims 11-14 and further in view of U.S. Patent No. 6,229,209 issued to Nakamura et al. This rejection is respectfully traversed in that the patent to Nakamura et al. does nothing to overcome the aforementioned shortcomings associated with the teachings of Inoue.

Initially, in rejecting Applicants' claimed invention it is noted that the Examiner states that Inoue renders obvious the limitations in the claims as discussed above except for a second group of through holes which are provided in electrodes of the plurality of semiconductor elements, passed from a surface through the backside of the substrate, and whose faces are covered with a conductive material. In this regard, for the reasons discussed hereinabove, it is again respectfully asserted that Applicants' claimed invention is not rendered obvious in view of the teachings of Inoue as discussed in detail hereinabove.

Additionally, as can be seen from the foregoing amendments, independent claim 15 has been amended to recite an RF device comprising a plurality of semiconductor elements formed in a semiconductor substrate, a first group of through holes which are provided between two adjacent ones of the plurality of semiconductor elements and passed from a surface through the backside of the semiconductor substrate and whose side faces are covered with a conductive material, a second group of through holes which are provided in electrodes

of the plurality of semiconductor elements, passed from a surface through the backside of the semiconductor substrate, and whose side faces are covered with the conductive material, wherein the conductive material which covers the side faces of the first and second groups of through holes is electrically connected to a wiring layer provided on the backside of the substrate, and a distance between two adjacent ones of the first group of through holes is smaller than a thickness of the semiconductor substrate so as to reduce power leakage between two adjacent ones of the plurality of semiconductor elements. Again, as discussed in detail hereinabove it is respectfully submitted that the patent to Inoue neither discloses nor remotely suggests such features. Further, the patent to Nakamura et al. fails to overcome such shortcomings.

With respect to the teachings of Nakamura et al., it is noted that this reference merely discloses that side faces of through holes are covered with a conductive material; however, this reference fails to disclose that the isolation between the adjacent semiconductor elements is improved by shortening the distance between the two adjacent through holes. As is the case with Applicants' claimed invention. Accordingly, it is respectfully submitted that Applicants' claimed invention as set forth in independent claim 15 as well as those claims which depend therefrom clearly distinguish over the combination proposed by the Examiner and is in proper condition for allowance.

With respect to new claims 17 and 18, each of these claims recite similar features wherein the distance between two adjacent ones of the plurality of through holes or first group of through holes is smaller than a thickness of the semiconductor substrate so as to exponentially reduce power leakage between two adjacent ones of the plurality of semiconductor elements with regard to the distance between two adjacent ones of the plurality or first group of through holes. As noted from Fig. 2 as well as page 8, lines 13-18

of Applicants' specification, this figure shows that the isolation between the two adjacent semiconductor elements is exponentially improved by the unit of dB when the g/d < 1 is satisfied. Accordingly, it is respectfully submitted that Applicants' claimed invention as set forth in each of new claims 17 and 18 is supported by Applicants' specification and clearly distinguishes over the prior art of record.

Therefore, in view of the foregoing it is respectfully requested that the rejections of record be reconsidered and withdrawn by the Examiner, that claims 11-18 be allowed and that the application be passed to issue.

Should the Examiner believe a conference would be of benefit in expediting the prosecution of the instant application, he is hereby invited to telephone counsel to arrange such a conference.

Respectfully submitted,

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